

in the face of prolonged fever, too few make a second bacteriological study to determine whether or not a secondary contact infection has occurred.

In discussing secondary infection, Opie states:

"Pneumonia cannot be regarded as one disease, but must be looked upon as a group of different diseases, with more or less similar physical signs and symptoms, it is true, but caused by a considerable variety of bacteria, infection with any one of which not only provides no protection against infection with another, but even may render the individual more susceptible to secondary infection." . . .

The fact that secondary infection is possible must of necessity revolutionize all of our previous knowledge of pneumonia, particularly from the standpoint of immunology, and must arouse in us a sense of clinical asepsis which in every way should equal the care with which a surgeon approaches an operation.

#### CONCLUSIONS

To sum up briefly the clinical lessons gleaned from this epidemic, I would say:

1. Cyanosis is one of the earliest objective signs of a pneumonic complication in influenza.
2. Prevention of contact infection should be sought in every case of pneumonia, with attention to early isolation.
3. Primary infection of either upper lobe is not as infrequent as was previously supposed; right middle lobe involvement is not common.
4. The pneumonia problem of the future should be looked at from the standpoint of preventive medicine and should be made a part of the problem of public health service as much as any of the other epidemic diseases.

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## UNUSUAL COMPLICATIONS IN A CASE OF MIDDLE EAR INFECTION \*

By ISAAC H. JONES, M. D., Los Angeles

This case report is made because it presents many unique features, and sheds some light on the problem of surgical treatment of tympano-mastoid infection, associated with labyrinth irritation. I feel that if a similar case presents itself in the future, we would handle it in the same way, but we want to emphasize that such a combination of phenomena is rarely seen, and that the treatment and handling of this case, is not to be regarded as the way to handle an average case of tympano-mastoid infection.

Briefly, the case presented an apparently mild otitis media, violent labyrinth irritation, and a very large post-auricular abscess. The superficial abscess was drained, but the internal ear region was left strictly alone—a mastoid operation was *not* done. We thought it wise to wait, although, of course, we stood ready to open the mastoid if anything occurred to suggest its necessity. This very thing happened two months later—at which time the patient began to have disquieting symptoms, and the X-ray showed unquestioned involvement of the mastoid. Mastoid operation was then advised as being the safer procedure, although it was explained to the patient that there was a possibility of spontaneous recovery. The family preferred not to have the operation; fortunately, the patient made a satisfactory recovery. A careful examination made three days ago shows normal middle ear, normal cochlea, and a complete absence of all irritative symptoms—a fact the patient is entirely well, except for a diminution of function of the vestibular portion of the labyrinth.

The patient is a male, age 33, who has enjoyed good health; is of good mentality, and has unusual ability as an organist. He served in Royal Air Force in Canada, and had not previously suffered from dizziness, staggering, deafness or tinnitus.

In November, 1920, the patient contracted an acute nasal infection, following sea bathing. He used salt water douches, "trying to dislodge what was in the nose." This caused right earache, for which he consulted a doctor, who suggested opening the drumhead. This was not permitted, so nasal and throat treatments were substituted. Had two treatments a week—for six weeks—then followed a period of six weeks without treatment, and practically without symptoms. Then a recrudescence of ear symptoms occurred, for which he again consulted the doctor, who removed polyps from left naris.

On December 8, 1920, Dr. von Wedelstaedt noted a mild congestion of the right middle ear. The patient felt a bit dizzy while at the doctor's office, and then went to the theater. It was thirty minutes after that the attack occurred.

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As he was playing the organ, he began to notice that he could not turn his eyes to the left; (it was necessary for him to look to the left in order to see the moving pictures, and synchronize the themes of his music with the portion of the picture being shown). He found that he could turn his entire head to the left and watch the pictures, but that he could not turn his eyes toward the left without being made violently dizzy. He managed to play for the entire thirty minutes expected of him, and then suddenly he was seized with violent vertigo and fell to the left, pitching from the organ seat down into the organ pit, where he lay for one hour and a quarter, with six attacks of nausea and vomiting, vertigo and inability to move. He was found in this condition—entirely conscious, however.

During attack:

1. External objects all whirled from his left to his right.

2. He could not look to the left without becoming more violently seasick.

3. The falling tendency was entirely to the left.

4. In the organ pit, he found some comfort by lying on the right side, and stated, "If I rolled over on my back or on my left side, it brought on seasickness."

In analyzing this, it would seem that he had a pull of the eyes to the right, and that he was more comfortable when his eyes were kept in this position toward the right. Dr. Hiller took him home, at Dr. von Wedelstaedt's request, and put him on his right side. During the night, he tried to turn to the left side and vomited each time. He once tried to turn on his back, and immediately vomited. If he tried to walk, he fell forward. Each time he got on his feet, the room would whirl from his left to his right. He continued to vomit off and on for three days. On the fourth day, he was able to retain a little food, and he found that he could then lie on his left side without getting sick. On this fourth day, Dr. von Wedelstaedt felt it wise to do a paracentesis of right drum membrane, although no pus was forthcoming. The patient had been noting a rather mild earache, and on the fifth day he began to have "an entirely different kind of an earache," caused by a quickly appearing post-auricular swelling. At this time, Dr. von Wedelstaedt referred the patient for consultation.

Examination, December 17, nine days after the attack, revealed a curious otoscopic picture; the drum membrane showed some middle ear involvement, but the most noticeable thing was a good-sized mass, in the center of which was a pouting granulation situated distinctly external to the drum membrane, and on the posterior inferior wall of the external canal. Pneumatic suction caused the drum membrane to move, but failed to affect the contour of this mass.

Incision caused this external mass to subside within twenty-four hours; no swelling of the posterior superior wall, and the day following, the drum membrane looked almost nor-

mal. It was considered possible that the large post-auricular abscess had been produced through the external canal and not through mastoid involvement. Hearing was somewhat impaired in right ear, but bone conduction was greater than normal, and Weber lateralized to affected side (right); conversational voice well heard, and whispered sibilants at three feet; both cochleas normal. Caloric test showed marked impairment of responses from right ear. This, at first, made us think that the right vestibular function was impaired; however, the turning tests produced an unusually large and prolonged nystagmus, equally after turning to the right and to the left, and demonstrated that the internal ear was not only normal but somewhat hyperactive. We considered that the impaired responses to douching could be accounted for, in that the mass in the external canal and the moderate thickening of the drum membrane together might have prevented the cooling effect from reaching the internal ear. Incidentally, it is sometimes asked why the caloric test might not make the turning test unnecessary. This data given above shows the wisdom of performing every test whatsoever that could give any information in such a serious case. If we had relied upon the douching test alone, we would surely have drawn a wrong conclusion, and would have probably concluded that the internal ear was probably becoming purulent, even though the cochlea was normal.

*Summarizing*—Cochlea normal, and turning showed functioning vestibular portion. The internal ear was evidently intact, in both cochlear and vestibular portions; the middle ear showed little evidence of activity; the mastoid region showed large post-auricular swelling, but with no bulging of posterior superior wall. Because of the recent labyrinth symptoms, and the danger of disturbing the quiescent state of the labyrinth, it was decided to do an exploratory operation. Under local anaesthesia, a postauricular incision was made, evacuating a large quantity of pus. The periosteum was then incised and laid back, exposing normal bone. This is all that was done. It was decided for the present to defer mastoid operation. The patient made a good immediate recovery. Two weeks later, while at a theater, he had headache, and could not walk in a straight line.

January 16, paracentesis, after which staggering gradually lessened, although he noted that external objects appeared to jump up and down.

February 1, while playing the organ, sharp pain on top of head lasting a few seconds; suddenly there was "a click in the head, as if something had snapped"; after this the sharp pain ceased, and there was a burning sensation on top of head. The next morning, on looking to the right, everything stationary; on looking to the left, objects seemed to move up and down.

February 3, again objects jumped up and down, when looking to the left. While walking with a friend on his left side, patient was continually bumping into him; sensation of pressure in back of head (lower occipital region); unable to sleep

and tossed around in bed. Mastoid operation was suggested to patient, but was refused. About one o'clock in the morning, patient "began to feel shaky" and right arm began to shake; after two or three minutes the legs commenced to shake. There had been at no time any nausea, vomiting or sweating. Since February 1, soreness and throbbing behind the right ear; on February 4, throbbing had disappeared, but soreness remained.

*Neurologic examination by Dr. Samuel D. Ing-ham*—"Face flushed, expression anxious; eyeballs unsteady, but no definite nystagmus, even on lateral deviation, when subjective vertical movement of objects occurred. Station good and on each foot separately—eyes open and closed—no motor cranial paralysis. Tendon reflexes in arms and legs somewhat excitable."

Eye examination by Dr. E. R. Lewis showed probable nonpathologic tortuosity of the veins. Margins of discs were not obscure.

*February 5*—Fistula test markedly positive. Pressure upon the drum membrane, which is entirely intact, produced a sustained rotary movement of the eyes to the left; no horizontal movement whatever; and no quick component. This air pressure also produced a subjective sensation of falling to the left, and also a subjective sensation of external objects moving upward and to the left.

*Galvanic Test*—Anode and kathode gave normal responses from both ears—five milliamperes—suggesting intact internal ears; in fact, there was a rather better response from the affected ear than from the other.

*X-ray Examination by Dr. William Bowman*—"Cells of right mastoid appear to be filled with fluid or pus, and a portion of the cell walls is destroyed at the point indicated by an arrow on the plate. Another plate was made for the purpose of checking these findings, and again the mastoid region showed marked pathologic changes, with cell destruction in the mastoid region."

The patient was willing and rather anxious to have the mastoid opened, but the family persuaded him not to have any operation. For two weeks the patient had symptoms of pain and headache, and then all discomfort disappeared. He has been perfectly well ever since—three months.

Examination right now, May 9, shows normal drum-membrane, apparently normal middle ear and perfect hearing. In fact the patient could be considered to be quite unaffected by his illness except—

1. There is a striking reduction of vestibular function, evidenced by reduction of after-turning nystagmus from 34 and 34 to 17 and 13.

2. The rather unique exenteration of mastoid cavity shown by X-ray. Dr. Bowman's report: "At a former examination the mastoid cells were murky and indistinct, but while a portion of the trabeculae had been destroyed, there were still some mastoid cells left in the lower-half of the mastoid. Now, the right mastoid region fails to reveal any evidence of any normal mastoid cells,

the trabeculation having been entirely destroyed. The bone, however, is clear and shows no evidence of any necrotic area."

#### SUMMARY

1. We consider it quite possible that a mastoid operation, if done in the first place, might have resulted in stirring up a purulent labyrinthitis.

2. When later it became apparent that all was not well within the mastoid, it would have been safer to have opened the mastoid antrum, when we realize that the necrosis eventually not only exenterated the mastoid, but produced a fistula into the labyrinth; it is to be regarded as simply good fortune that the refusal of operation turned out as well as it did.

3. It is unwise to generalize about cases of labyrinth involvement, except to suggest that we should show hesitation in invading the region of the internal ear during an irritative attack, unless there is urgent necessity to drain an unquestionably purulent mastoiditis. Needless to say, the average case is that of definite purulent otitis, with involvement of the mastoid antrum, and in all such cases, of course, we should not only do a thorough paracentesis, but also open the mastoid antrum. This case, however, is not an average case and it impresses us that we must not generalize, but let each individual case be a law unto itself.

### THE TREATMENT OF HUNNER'S ULCER OF THE BLADDER BY FULGURATION\*

By HARRY A. R. KREUTZMANN, M. D., San Francisco

In 1914 Hunner reported in detail eight cases of bladder ulcer in women of a type, which previous to that time, had not been recognized. Due to the position of the ulcers and also to the fact that so little pathology is observed cystoscopically in contrast to the severe symptoms, this condition had previously been overlooked.

Nitze described a condition of the bladder-wall, which, no doubt, is the same as that presented by Hunner. However, the credit belongs definitely to Hunner for having emphasized this condition, and having brought it forcibly to the attention of the medical profession. Since his first paper this condition has been made familiar, and about seventy-six cases have been reported.

This type of ulcer has been given a number of different names. Cullen suggested "elusive ulcer of the bladder." Geraghty called it paracystitis; Keene named it circumscribed pan-mural ulcerative cystitis because all the coats of the bladder are involved. Bumpus considers submucous ulcer of the bladder appropriate, because of the great involvement of the submucous structure. The term most commonly applied is Hunner's ulcer.

The etiology was not definitely known until Bumpus (1921) reported that he had produced

\* Read before the St. Francis Hospital Clinical Group, October 28, 1921.